

Retail Sales Analysis

Enhancing E-commerce Performance with Data Insights

1. Objective

The goal of this analysis is to uncover key insights from online retail transaction data to improve sales strategies and enhance customer satisfaction. Specifically, the project aims to analyze sales performance, product trends, customer behaviour, and geographical patterns to support decision-making and future growth strategies.

2. Dataset Overview

The dataset is based on e-commerce transactional data. It contains detailed records of purchases made between 2010 and 2011 including Basic information of purchases like Customer ID, Product description, Country, Invoice Date etc.

Data manipulation was done across multiple columns to get the proper data to be considered for the Data Visualization.

Data Cleaning & Preparation

Cleaning Steps in Excel:

- Removed null rows and rows with missing CustomerIDs or negative Quantity/UnitPrice.
- Removed duplicates using the “Remove Duplicates” feature.
- Converted InvoiceDate into Date and Time columns separately.
- Corrected data types for Quantity and UnitPrice to numeric.
- Created a Total Revenue column: $\text{=Quantity} * \text{UnitPrice}$
- Extracted Hour, Moths and Day of Week from InvoiceDate using formulas.

Data Transformation:

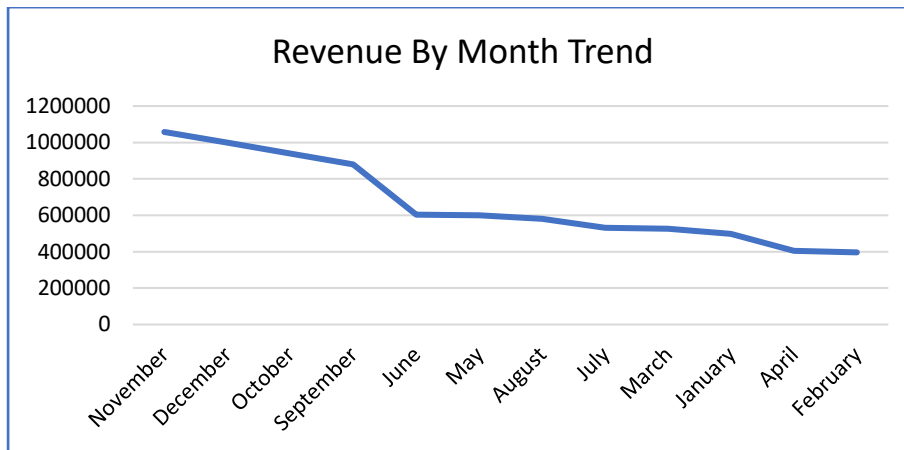
- Created PivotTables to aggregate revenue by country, month, and product.
- Grouped data to analyze daily, monthly, and time-of-day trends.
- Created helper columns to support visualizations.

3. Analysis & Insights

Sales Trends

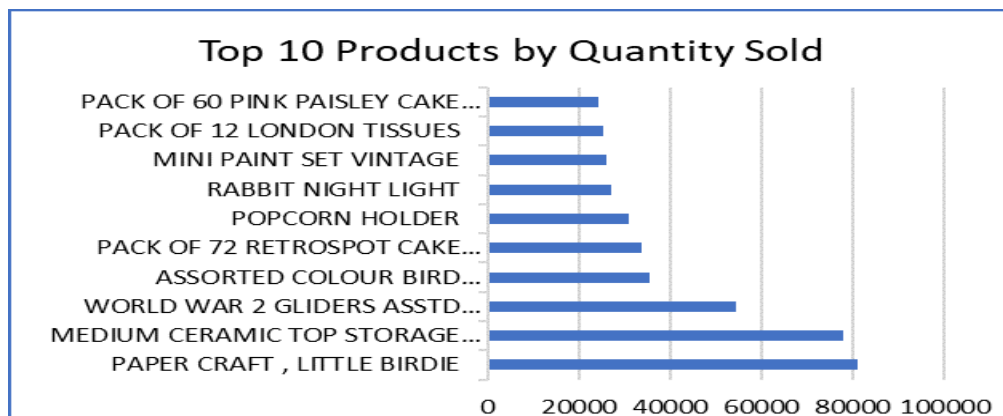
- **Highest sales month:** November with 1057634.25 in revenue.
- **Highest sales Year:** 2011 with 93.71% in total revenue.

- **Daily Revenue Trend:** Thursday and Tuesday show highest daily sales.



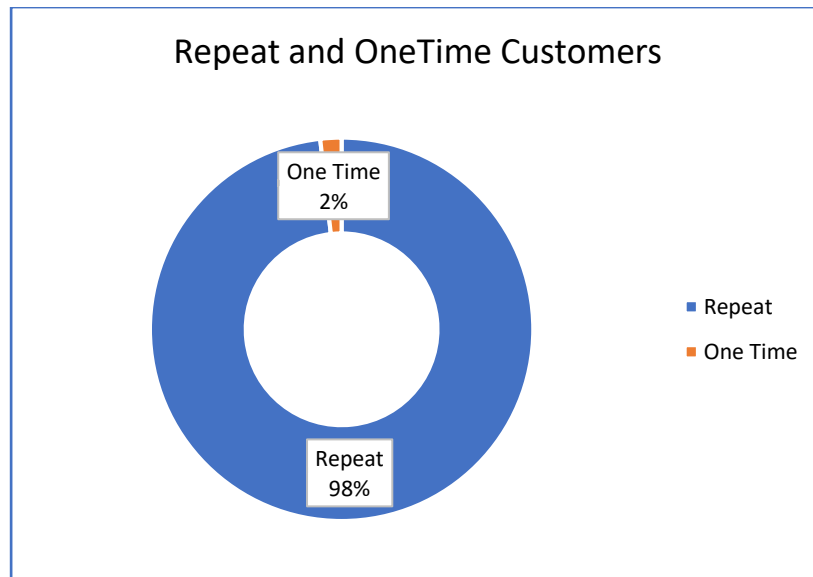
Product Insights

- **Top-Selling Product by Quantity:** “PAPER CRAFT LITTLE BIRDIE” with quantity of 80995.
- **Top Revenue-Generating Product:** “PAPER CRAFT LITTLE BIRDIE” with revenue of 168469.6.
- **Top 10 Products:**



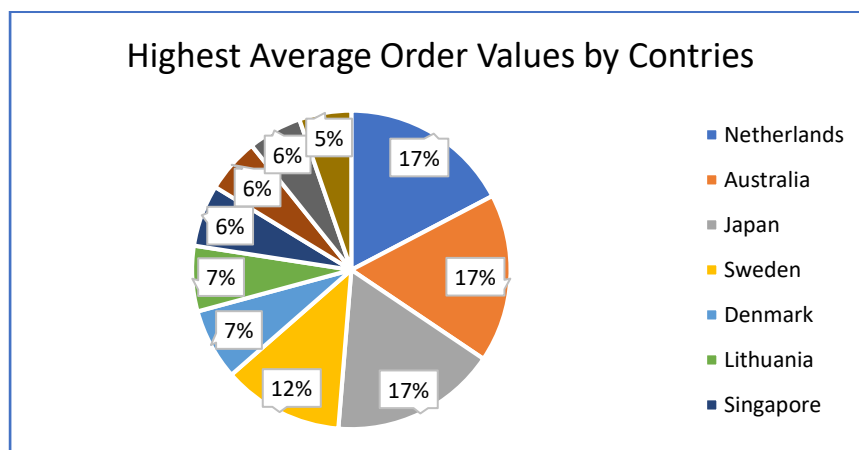
Customer Behavior

- **Average Revenue per Customer:** 22.073538.
- **Percentage of repeated customers:** =IF(B6>1, "Repeat", "One Time") Using IF condition with count of Customer ID.



Geographical Insights

- **Top 5 Countries by Sales Volume:** UK, Netherlands, EIRE, Germany, France.
- **Countries with Highest Avg. Order Value:** Netherlands, Australia, Japan, Sweden and Denmark.
- **Revenue by Country:** UK dominates with over 82.63% of total revenue.



Sales Efficiency Metrics

- **Average-Order-Value:**

$$AOV = \text{Total Revenue} / \text{Number of Invoices} = 22.07353889$$
- **Average Unit Price:** 2.88

4. Conclusion & Recommendations

Summary:

The analysis of online retail data from 2010–2011 shows that 2011 was the strongest year, contributing 93.71% of total revenue. November was the best month for sales, and Tuesdays and Thursdays had the highest daily revenue.

The top-performing product, “PAPER CRAFT LITTLE BIRDIE,” led in both sales volume and revenue. Most customers generated an average of £22.07, with many making repeat purchases.

The UK dominated sales (82.63%), but countries like Japan, Sweden, and Australia had higher average order values. Overall, the business had an Average Order Value (AOV) of £22.07 and Unit Price of £2.88.

Recommendations:

- Focus on November for major sales campaigns.
- Analyze 2011 strategies to understand what drove success.
- Encourage repeat customers with loyalty rewards.
- Run promotions on Tuesdays and Thursdays.
- Restock and promote best-selling products like “PAPER CRAFT LITTLE BIRDIE.”
- Expand into high-value markets (Japan, Sweden, Australia).
- Use bundles or upsells to increase order value.